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The Influence of Light on Reproduction in Vorticella.

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THE aim of the work briefly described in this article has been to ascertain the influence of monochromatic and different intensities of light on the reproduction of vorticella.

The vorticella were transferred by means of a Barber* capillary pipette, held in a modified triple-movement pipette holder.

From a culture of the unicellular organisms, that had been kept covered in the dark for several months, many encysted zoöids were isolated and transferred to a culture media, consisting of an infusion of Timothy hay. The infusion had been filtered, sterilized by boiling, and kept in sterilized sealed tubes until needed.

The encysted forms were under observation in a hanging drop placed in an open-end moist chamber.

As soon as the zoöids emerged from their cysts they were removed to a drop of the sterilized infusion placed on a Hemocytometer micrometer slide. By this means the direct increase in organisms could be ascertained. The slides with the young zoöids were placed in a Petri dish that contained a thin layer of water to prevent rapid evaporation of the solution. The organisms of the same age thus secured were kept for

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* Barber, M. A., Jour. of Infections Dis., 1911, vol. VIII, p. 348.

each series of observations, under the same conditions of temperature, moisture, food and intensity of light, but under different-colored rays, or where the intensity of light was studied under different intensities, for at least three days.

To ascertain the effect of colored rays, blue, green, yellow and red glass, gelatin films, and reflected rays from Hering's monochromatic colored cards were employed. The observations thus secured were compared with those made in sun or electric light of constant intensity. The colors were placed both in bright and dim light, and so that the reflected or transmitted rays penetrated the culture either from above or below. The heat rays were cut out by water contained in parallel-sided glass dishes placed in the path of the beams of light.

In order to study the influence of the intensity of light, the slides with the vorticella were placed either half or one and a half or two meters from a window having a southern exposure or electric light. Some were placed in a large blackened wall-box or in a box covered with smoked glass to vary the intensity of the rays of sunlight.

From the observations that were obtained from the various experiments, the following general conclusions were deduced:

1. Vorticella exposed to daylight for intervals of four days increase in number more rapidly on bright sunny days than on dark cloudy ones.

2. When the zoöids are placed at different distances from the source of light on an average 25 develop one-half meter, 10 one and one-half meter from the light, and 2 in the dark.

3. In comparing the greatest number that developed on sunny days from one zoöid in 24 hours it was seen that 40 grew under green, 29 under yellow, 26 under white, 13 under blue, and 17 under red.

4. The average rate of increase on cloudy days or under dim light was 4 for yellow, 3 for green, 2 for blue, white or red.

5. We conclude that the stimulating effect on the reproductive power of vorticella increases up to an optimum with increased intensity of light, and that the bright, luminous rays of yellow and green are more effective as stimulating agencies on the reproductive power of vorticella than are the red or blue rays.